

Algebra II

Rational Expressions A.35

Name _____

Date _____

For problems #1-2, collect all similar variables before reducing. For problems #3-6, factor completely before reducing. SHOW ALL WORK!

1. Simplify: $\frac{3x^3y^2}{14xy^3} \cdot \frac{21x^6y^4}{9xy^5}$

a) $2x^7y^2$ b) $\frac{x^16}{2}$ c) $\frac{x^9}{2y^2}$

d) $\frac{x^7}{2y^2}$ e) $\frac{x^9}{y^2}$

2. Simplify: $\frac{8x^3y^4}{12x^4y^3} \cdot \frac{9x^2y^3}{6x^3y}$

a) $\frac{y^4}{x^6}$ b) $\frac{y^3}{x^2}$ c) $\frac{2y^4}{x^6}$ d) $\frac{y^5}{3x^3}$ e) $\frac{2y^3}{3x^2}$

3. Simplify: $\frac{x^2 - 4x - 12}{x^2 - 4} \cdot \frac{1}{x - 6}$

a) $\frac{x^2 - 36}{x - 2}$ b) $\frac{x - 3}{x - 6}$ c) $\frac{1}{x - 2}$

d) $\frac{(x - 6)^2}{x + 2}$ e) $\frac{2x - 12}{x - 2}$

4. Simplify: $\frac{x^2 + 10x + 21}{x^2 - 9} \cdot \frac{1}{x + 7}$

a) $\frac{x^2 + 14x + 49}{x + 7}$ b) $\frac{x + 3}{x - 3}$

c) $\frac{(x^2 + 49)}{x + 7}$ d) $\frac{x}{7}$

e) $\frac{1}{x - 3}$

5. Give the product of this expression in simplest form: $\frac{x - 3}{x^2 - 6x + 9} \cdot \frac{x^2 + 4x + 4}{x + 2}$

a) $\frac{x - 3}{x + 2}$ b) $\frac{x + 2}{x - 3}$

c) $x^2 - 2x$ d) $(x - 3)(x + 2)$

e) $-\frac{2}{3}$

6. Simplify: $\frac{2x^2 - x - 3}{2x^2 - 2x} \cdot \frac{6x^3 - 6x^2}{4x^2 - 9}$

a) $\frac{2}{3}$ b) $\frac{9 - x^3}{6}$ c) $\frac{6x + 2}{2x - 1}$

d) $\frac{3x^2 + 3x}{2x + 3}$ e) $\frac{3x - 3}{2x - 3}$

7. Simplify: $\frac{2x^2 + x - 3}{2x^2 + 2x} \cdot \frac{6x^3 + 6x^2}{4x^2 - 9}$

- a) $\frac{2}{3}$ b) $\frac{9 - x^3}{6}$ c) $\frac{6x - 2}{2x - 1}$
 d) $\frac{3x - 3}{2x - 3}$ e) $\frac{(3x)(x - 1)}{2x - 3}$

8. Give the product of this expression in simplest form: $\frac{x^2 - 6x + 9}{x + 2} \cdot \frac{2}{9 - x^2}$

- a) 6 b) $\frac{-2}{x + 5}$
 c) $\frac{-2x}{x^2 + 5}$ d) $\frac{2(x - 3)}{(x + 2)(3 + x)}$
 e) $\frac{-2(x - 3)}{(x + 2)(3 + x)}$

9. Simplify: $\frac{3x^2 - 6x}{4 - x^2} \cdot \frac{3x^2 + 5x - 2}{27x^2 - 3}$

- a) $\frac{-x}{3x + 1}$ b) $\frac{x}{3x + 1}$
 c) $\frac{-x(x - 2)}{(3x - 1)(x + 2)}$ d) $\frac{x(x - 2)}{(3x - 1)(x + 2)}$
 e) $\frac{-x(x + 2)}{(3x - 1)(x + 2)}$

10. Simplify: $\frac{4x(x - 5)^2}{2(x - 5)(x + 1)}$

- a) $\frac{2x}{x + 1}$ b) $\frac{2x(x - 5)}{x + 1}$ c) $\frac{2x^2 + 10x}{2(x + 1)}$
 d) $\frac{2x^2 + 10x}{x + 1}$ e) $\frac{x}{x + 1}$

11. Simplify: $\frac{8x(x - 3)^2}{4(x - 3)(x + 2)}$

- a) $\frac{x}{x + 2}$ b) $\frac{2x}{x + 2}$ c) $\frac{2x^2 + 6x}{x + 2}$
 d) $\frac{2x^2 + 6x}{2(x + 2)}$ e) $\frac{2x(x - 3)}{x + 2}$

12. Simplify: $\frac{x + y}{x - y} \div \frac{y + x}{y - x}$

- a) 1 b) -1 c) 0
 d) $-\frac{(x + y)^2}{(x - y)^2}$ e) $-\frac{(x - y)^2}{(x + y)^2}$

13. Simplify: $\frac{1}{1 - y} \div \frac{1}{y - 1}$

- a) $-\frac{1}{(y - 1)^2}$ b) $-y^2 + 2y - 1$
 c) 1 d) -1
 e) 0

14. Simplify: $\frac{3x^2}{x - y} \div \frac{12x^5}{4(x - y)}$

- a) x^3 b) $-x^3$ c) $\frac{1}{x^3}$
 d) $\frac{3x - 3y}{4x^3}$ e) $\frac{9x^7}{(x - y)^2}$